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EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/725,771	RAO ET AL.	
	Examiner	Art Unit	
	Michael C. Colucci	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This office action is in response to the amendment filed 10/01/2007 where "subject matter and the claimed invention were, at the time the claimed invention was made, owned by the same person or subject to an obligation to assignment to the same person." 35 U.S.C. § l03(c) (1)", particular Broadcom Corporation.

Response to Arguments

1. Applicant's arguments, see Remarks pages 1-3, filed 10/01/2007, with respect to the rejection(s) of claim(s) 1-19 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of USPGPUB 20020103635 A1 and US 6823310 B2.

Claim Rejections - 35 USC § 112

2. Claim 2 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The limitation within claim 2 for "processing all groups together", wherein "groups" is indefinite and it is uncertain as to what "groups" refers to. Therefore, the limitation and use of "groups" will be understood to be relative to memory or buffers.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5, 8-9, 12-14, and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Mesarovic et al USPGPUB 20020103635 A1 (hereinafter Mesarovic).

Re claim 1, Mesarovic teaches a method of reducing memory required to decode an audio signal in an audio decoding system, the method comprising:

performing a first audio decoding function ("The AAC noiseless decoding tool 430 takes information from the bit stream demultiplexer 400, parses that information, decodes the Huffman coded data, and reconstructs the quantized spectra and the Huffman and DPCM coded scale factors"; [0037] & Fig. 4 item 430);

writing data corresponding to the first audio decoding function to a memory ("A write pointer 604 is provided, which indexes the writing of the 1024-sample blocks..."; [0057]);

performing a second audio decoding function ("The BSAC tool 440 provides an alternative to the AAC noiseless coding tool, which provides fine granule scalability. This tool takes information from bit stream demultiplexer 400, parses that information, decodes the arithmetic-coded bit-sliced data, and reconstructs the quantized spectra and the scale factors."; [0039] & Fig. 4 item 440);

writing data corresponding to the second audio decoding function to at least a portion of the memory, whereby the data corresponding to the first audio function is at least partially overwritten by the data corresponding to the second audio decoding function ("the 1024 samples from the previous block, which were kept in data memory as "history data," are overwritten with the second half of the IMDCT output after layable PCM samples 510 are produced. Collectively, blocks 504, 506 and 508 are referred to as the filterbank 485. The second half of the current block is again used as "history data" in overlap-and-add step of the next cycle"; [0055]).

NOTE: Data kept/stored in memory is construed to be functionally equivalent to data written to memory, where the process of storing and writing are equivalent to one another. Mesarovic teaches a serial/parallel host interface 301 that allows an external controller to communicate with decoder 100 through the HOST port. Data received at the host interface port 301 can also be routed to Input Data Unit 300 (0026 and Fig. 3).

Re claims 2 and 13, Mesarovic teaches the method according to claim 1, wherein the audio decoding functions are for processing all groups together ("Total buffering requirements can be substantial... 1024-word data memory buffer (per channel) may be

allocated for storing playable PCM samples...Once the 1024-word sample has been stored for each channel of an exemplary 6-channel system, then the decoder has enough PCM samples to play for the duration of the whole block"; [0058]).

Re claims 3 and 14, Mesarovic teaches the method according to claim 2, further comprising performing the audio decoding functions in an order based upon memory allocation ("Consequently, for the second channel in the block, less memory needs to be statically allocated for the PCM buffer, and so on. In this fashion, the playable PCM buffer sizes can be defined in the decreasing order to make advantage of the decode dynamics" [0064]).

Re claim 4, Mesarovic teaches the method according to claim 2, wherein a minimum amount of memory to perform the audio decoding functions in a particular group is allocated. ("minimizing the memory used in an audio decoding application for Pulse Code Modulation ("PCM") buffering"; [0003]).

Re claim 5, Mesarovic teaches the method according to claim 1, wherein a minimum amount of memory to perform all audio decoding functions in a single memory device is allocated ("minimizing the memory used in an audio decoding application for Pulse Code Modulation ("PCM") buffering"; [0003] & Fig. 4).

Re claims 8 and 17, Mesarovic teaches the method according to claim 1, wherein at least one audio decoding function is optimized to reduce memory used to process the function ("One described PCM buffer management technique minimizes data memory requirements through the use of non-uniform size PCM buffering. These optimizations are based on AAC decoding dynamics and the available processing capacity budget"; [0005]).

Re claim 9, Mesarovic teaches the method according to claim 1, further comprising performing a plurality of audio decoding functions in a single memory device ("minimizing the memory used in an audio decoding application for Pulse Code Modulation ("PCM") buffering"; [0003] & Fig. 4), wherein memory sufficient to perform an audio decoding function using a maximum amount of memory is allocated ("the C channel arrives first in the stream, as described above the C channel buffer 802 is maximized, for example, to 2.times.1024 words"; [0065]), and each audio decoding function is performed using less memory in the single memory device ("So, by the time the second channel is decoded, more space will be available in the second PCM buffer 804. Consequently, for the second channel in the block, less memory needs to be statically allocated for the PCM buffer"; [0064]).

Re claim 12, this claim contains limitations that are significantly similar to those found within claim 1. Therefore claim 12 has been rejected for similar reasons.

Re claim 18, this claim contains limitations that are significantly similar to those found within claim 1. Therefore claim 18 has been rejected for similar reasons.

Re claim 19, this claim contains limitations that are significantly similar to those found within claim 1. Therefore claim 19 has been rejected for similar reasons.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 6-7,10-11, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mesarovic et al USPGPUB 20020103635 A1 (hereinafter Mesarovic) in view of Ishito et al US 6823310 B2 (hereinafter Ishito).

Re claims 6 and 15, Mesarovic fails to particularly teach, but Ishito teaches the method according to claim 1, wherein each of a plurality of memory devices are allocated to storing data corresponding to at least one audio decoding function (Ishito Fig. 1 items 100, 107, and 108).

Ishito teaches an audio decoding apparatus to receive a bit stream on a block by block basis (Ishito abstract), where data is exchanged between multiple memory

devices such as the internal and external memory devices, where multiple decoding operations/functions take place (Fig.1 item 108 and as a whole).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention a plurality of memory devices allocated to storing data corresponding to audio decoding functions. Having multiple memory devices would allow additional buffering where data within one memory would need to be accessed a minimum number of times as the data stream is read from one memory into another to be processed by various decoding operations, reducing the overall operations.

Re claims 7 and 16, these claim contain limitations that are significantly similar to those found within claim 6. Therefore claims 7 and 16 has been rejected for similar reasons.

Re claim 10, Mesarovic teaches writing data corresponding to the second audio decoding function to at least a portion of the another memory, whereby the data corresponding to the third audio function is at least partially overwritten by the data corresponding to the second audio decoding function ("the 1024 samples from the previous block, which were kept in data memory as "history data," are overwritten with the second half of the IMDCT output after layable PCM samples 510 are produced. Collectively, blocks 504, 506 and 508 are referred to as the filterbank 485. The second half of the current block is again used as "history data" in overlap-and-add step of the next cycle"; [0055]).

However, Mesarovic fails to teach, but Ishito teaches the method according to claim 1, further comprising: performing a third audio decoding function to another memory (Fig.1 item 108 and as a whole);

Ishito teaches an audio decoding apparatus to receive a bit stream on a block by block basis (Ishito abstract), where data is exchanged between multiple memory devices such as the internal and external memory devices, where multiple decoding operations/functions take place (Fig.1 item 108 and as a whole). Both Mesarovic (figure 4) and Ishito (figure 1) teach multiple decoding operations occurring within an audio decoding process.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention performing a third audio decoding function to another memory. Performing multiple audio decoding operations/functions would allow the decoding of various types of coded input audio signals such as BSAC, AAC, Huffman, etc.

Re claim 11, Mesarovic teaches the method according to claim 1, further comprising:

allocating memory sufficient to perform an audio decoding function using a maximum amount of memory within each grouping;

performing all audio decoding functions in a grouping within the memory allocated to perform the function using the maximum amount of memory ("the C channel arrives first in the stream, as described above the C channel buffer 802 is maximized, for example, to 2.times.1024 words"; [0065]).

However, Mesarovic fails to teach, but Ishito teaches performing a plurality of audio decoding functions grouped into a plurality of groupings in a plurality of memory devices (Ishito Fig. 1 items 100, 107, and 108);

Ishito teaches an audio decoding apparatus to receive a bit stream on a block by block basis (Ishito abstract), where data is exchanged between multiple memory devices such as the internal and external memory devices, where multiple decoding operations/functions take place (Fig.1 item 108 and as a whole). Both Mesarovic (figure 4) and Ishito (figure 1) teach multiple decoding operations occurring within an audio decoding process.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention performing a plurality of audio functions grouped together in a plurality of memory devices. Having multiple memory devices would allow additional buffering where data within one memory would need to be accessed a minimum number of times as the data stream is read from one memory into another to be processed by various decoding operations, reducing the overall operations. Also, performing multiple audio decoding operations/functions would allow the decoding of various types of coded input audio signals such as BSAC, AAC, Huffman, etc.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5867819 A, US 5890112 A.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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